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How is School-Based Mental Health Educationally Relevant? Exploring the Academic Outcomes of a CBT Intervention for Trauma in Schools

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How is School-Based Mental Health Educationally Relevant? Exploring the Academic Outcomes of a CBT Intervention for Trauma in Schools

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Abstract

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The psychological and behavioral effects of trauma are well documented, as are its significant disruptions to developmental trajectories over the lifespan. Besides providing access to children, schools offer familiar and supportive settings in which to conduct trauma therapy. The proposed study uses a randomized controlled design to examine the impact of participation in a school-based treatment program for youth experiencing posttraumatic stress (CBITS). Participants include a sample of 160 sixth graders from a low-income background who have experienced trauma and report elevated levels of posttraumatic stress. In addition to symptom indicators, measures of student engagement and classroom behavior will be collected prior to and following the intervention. Post-score differences between intervention and control groups will be analyzed for each outcome with adjustment for baseline differences. It is expected that

students in the intervention group will exhibit lower levels of PTSD, more positive classroom behavior, and higher perceived engagement in learning. These predictions align with research documenting the relationship between academic and socio-emotional functioning. Well-developed school-based programs have the potential to address macro-level disparities in care and to improve academic functioning for students experiencing posttraumatic stress. Finally, addressing trauma in the schools is a wise investment that will head off future social service costs.

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Chapter 1: School-Based Mental Health

UNMET NEED

There is a well-documented unmet need for youth mental health services. According to the U.S. Surgeon General, 20% of children and adolescents will experience symptoms of a mental health disorder over the course of a given year (U.S. Department of Health and Human Services, 1999), while nearly 50% of adolescents experience a mental health disorder before age 18 (Merikangas, He, and Burstein et al. 2010). The long-term negative effects of having a psychiatric disorder are well documented and involve major life domains such as health, finances, educational attainment, and employment. Aside from the individual and familial toll of mental health problems, they are costly to society. A 2009 Institute of Medicine Report estimated the yearly expenditure on child mental health to $247 billion (O'Connell, Boat, & Warner, 2009). This was cited as one of the fastest growing areas within child healthcare. The report concludes with a strong mandate for federal spending on mental health prevention efforts. The Seattle Social Development Project, which develops programs targeting emotional and behavioral disorders, estimates that investing in prevention could save nearly $10,000 per student given the long-term social costs these youth would incur without treatment (Aos, Lieb, Mayfield, Miller, & Pennucci, 2004).

For youth experiencing a mental health disorder, accessible treatment options may be hard to find. A 2005 report by the Substance Abuse and Mental Health Services Administration (SAMHSA) revealed that of 2.2 million adolescents who reported a major

depressive episode in the past year, around 60% did not receive any treatment (2005a). One study found that as many as 80% of youth who qualified as needing mental health services did not receive them within the school year (Kataoka, Zhang, & Wells, 2002). Latino students, and those who without insurance, demonstrated the highest rates of unmet need.

The burden of youth mental healthcare has fallen largely on the schools, which are considered the major service providers across most U.S. states (Rones & Hoagwood, 2000). According to results from a 2002-2003 survey of U.S. school districts, one-fifth of students were receiving some type of school-supported mental health service, and most schools reported having at least one staff member responsible for providing such services (often a school counselor, nurse, school psychologist, or social worker) (Foster, Rollefson, Doksum, Noonan, Robinson, & Teich, 2005). However, two thirds of the districts surveyed reported an increase in need for mental health services, while one third reported a decrease in funding for these services over the same period.

Except for the family, school is the primary setting in which a child interacts. As such, schools are ideal access points through which to monitor and intervene in mental health. Given the cognitive, social, and emotional demands academics place on students, school-based treatment offers ideal opportunities for therapeutic practice and collaboration with influential adults in the child's life (i.e., teachers).

A strong body of research has advocated for greater integration of mental health services into the school system. For example, a 2009 Surgeon General's report cited the role of schools in identification and referral for mental health services (U.S. Department

of Health and Human Services, 1999). Results from a 2002 study bolstered this argument by finding that adolescent students were more likely to seek help for a mental health issue in schools that offer on-campus counseling services (Slade, 2002). Schools may be especially tailored to providing services for minority students, who were found to utilize community mental health services at substantially lower rates than their White (non-Latino) counterparts. Health insurance was another factor affecting rates of treatment; students whose families were uninsured or enrolled in Medicaid used school-based services at higher rates than those from families with private insurance (Slade, 2002). These findings suggest that school services are reaching students who may not otherwise have received services elsewhere.

THE SCHOOL BASED MENTAL HEALTH MOVEMENT

The idea of addressing mental health in schools is not new. As a general 'movement,' School Based Mental Health (SBMH) has existed in one form or another since the middle of the 20th century. It was not until the 80's and 90's, however, that it established an agenda and developed a set of services, which were broadly defined as "any program, intervention, or strategy applied in a school setting that was specifically designed to influence students' emotional, behavioral, or social functioning" (Rones & Hoagwood, 2000). As such, SBMH encompasses a wide variety of models, delivery mechanisms, and intervention targets. It includes initiatives spanning the continuum from prevention to intervention, and targets of change ranging from the individual, to the classroom, to the district. SBMH models might address competency- or resiliency-

building at one end, or mental health treatment at the other. Pretty much all services offered by school-based guidance counselors, social workers, and/or psychologists can be considered SBMH, along with certain degrees of participation by teachers and administrators. Direct services can include assessment and intervention (i.e., individual or group therapy), while indirect services include consultation and family- or community-collaboration. Given the large scope of services, a current priority for SBMH has been in efforts to organize and integrate existing services into multi-component, multi-tiered systems of support (Adelman & Taylor, 2010), much as academic services have been streamlined under the Response-to-Intervention (RTI) model.

In their book *Mental Health in Schools: Engaging Learners, Preventing Problems, and Improving Schools*, Adelman and Taylor survey the various research and practice agendas that operate within the domain of school-based mental health. They distinguish amongst the following agendas: increasing *access* to services for youth; increasing *availability* of services to the school community; promoting *adoption* of programming by schools; *improving processes* and interventions (e.g., referral systems); highlighting *economic interests* of school-related entities; and *re-conceptualizing student supports* entirely, such as through efforts to enhance multidisciplinary teamwork, improve service coordination, or develop multi-tiered systems of support (MTSS) (Adelman & Taylor, 2010).

While such widespread agendas reflect the complexity of organizing and delivering mental health in schools, Adelman and Taylor point to an underlying fragmentation in the SBMH field, a state that has left it without a coherent framework or

robust evidence base (2010). They note that, while demand for SBMH is evident, as a system it is overburdened, under-prioritized, and unable to meet the current need (2006). Other key thinkers in the area have described a number of impediments, a major one of which is a lack of data on program effectiveness (Hoagwood, Olin, Kerker, Kratochwill, Crowe, & Saka, 2007). According to them, the overall impact of school-based services is, as yet, poorly understood. A major step for the field is in better understanding and articulating this impact.

CALL FOR REFORM

Various reviews of school mental health have documented gaps in the research base and called for large-scale reform. A clear imperative is for a more systematic examination of the effectiveness of specific programming. A hallmark review by Rones and Hoagwood cites the need to better understand the mechanisms by which intervention components work to improve student functioning in the service of "harness[ing] knowledge in policy-relevant areas so that program development can be built on a surer basis" (2000, p. 224). A recent review by Hoagwood points to methodological gaps in the research base including a lack of 'gold-standard' Randomized Controlled Trials (RCT's) that include control groups, use standardized outcome measures, and collect pre-post data (Hoagwood et al., 2007).

Hoagwood and others call for strategic efforts to document the assessments and interventions that address mental health *in conjunction* with educationally relevant outcomes. Given its low priority on already over-burdened educational agendas, SBMH

must better align itself with the educational 'mission' of schools, foremost by demonstrating its impact on academic outcomes (Hoagwood et al., 2007; Atkins, Hoagwood, Kutash, & Seidman, 2010). In their review, Hoagwood and colleagues speak to the "uneasy alliance" between mental health and education, noting how each has pursued its knowledge base in "significant isolation" (2007, p. 66). A lack of collaboration and false sense of division has created barriers for the development and implementation of mental health programs in the schools, much to the detriment of students' social, emotional, and academic functioning.

There are many innovative models for school-based mental health services, but in order for these to receive attention and resources, their impact on student learning must be captured. Research needs to better examine how school-based interventions impact students' functioning in the school environment and which intervention features (i.e., delivery mechanisms, change targets, etc.) are most critical (Hoagwood et al., 2007). Studies to date have varied significantly across features (i.e., outcomes assessed, intervention intensity, problem targeted, etc.) making it difficult to isolate their impact across various academic variables. At the same time, closer attention should be given to identifying the contextual and environmental variables that may mediate the effects of mental health programming on academic achievement.

RELATIONSHIP BETWEEN SOCIO-EMOTIONAL AND ACADEMIC OUTCOMES

The literature base on *Social Emotional Learning* (SEL) has gone a long way in demonstrating the relationship between positive social-emotional health and performance

in school (Zins, 2004). One of the models posited, the *reciprocal relations model*, describes the longitudinal relationship between academic and social competence. Each variable exerts a bidirectional pattern of influence such that academic competence leads to social competence over time and vice versa (Welsh, Parke, Widaman, & O'Neil, 2001). This research suggests that school interventions will be most effective when they target both domains of functioning.

Social and emotional factors play a crucial role in the classroom. Multiple studies have found that students receiving prevention-based social-emotional support perform better academically (Zins, Bloodworth, Weissberg, & Walberg, 2007). For example, prosocial behavior has been associated with positive intellectual outcomes in numerous studies, and with performance on standardized achievement tests (Welsh et al., 2001). In a comprehensive review of over 200 SEL outcome studies, findings showed significant improvements in students' skills, attitudes, and behaviors (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). A study by Fleming and colleagues highlighted how social and behavioral characteristics (targeted by SEL interventions) were predictive of academic performance on standardized tests amongst 7th grade students (Fleming, Haggerty, Catalano, Harachi, Mazza, & Gruman, 2005). Specific predictors of achievement included teacher-reported attention regulation, commitment to school, and antisocial/disruptive behaviors. Clearly, empirical findings support the link between positive socio-emotional functioning, school behavior, and academic success. Addressing students' socio-emotional development is hardly irrelevant to education; rather, it is an integral component to fostering student success (Zins, 2004).

DEFINING ACADEMIC OUTCOMES

Within the small subset of SBMH trials that have included educationally-relevant outcomes, there has been marked inconsistency. Academic outcomes used in these trials can be grouped into the following categories: *achievement-related* (i.e., grades, test scores), *academically relevant day-to-day behavior* (i.e., disciplinary offenses, removal, absenteeism), and *classroom-based contextual variables* (i.e., classroom climate, student engagement, peer relationships) (Hoagwood et al., 2007). The most frequently studied academic outcomes in the SBMH literature, however, have been of "limited variety and quality," (p. 88) focusing mainly on achievement indicators such as test scores, grades, and attendance. These indicators, while certainly the most recognizable metrics of student success, are less sensitive to the changes that emerge immediately following a mental health intervention (Hoagwood et al., 2007). Hoagwood suggests that SBMH research should carefully consider the specific processes and mechanisms through which intervention components affect learning and performance, and by which indicators they are most evident. Outcome selection should take these mechanisms into account, how they are measured, and how they 'fit' with the particular intervention (Hoagwood 2007).

Promising Outcomes For SBMH

In the SEL literature base, Zins and colleagues define *academic success* according to the following three categories: school *attitudes* (i.e., motivation, responsibility, attachment), school *behavior* (i.e., engagement, attendance, study habits), and school *performance* (grades, test performance) (2004). Successful performance in school does

not happen in a vacuum—it is built upon positive behavior and attitudes. In this way, *performance* is a more distal outcome, while day-to-day aspects of classroom functioning (i.e., behaviors and attitudes) play mediating roles. Many SBMH programs directly target these mediators, and as such, represent good opportunities to demonstrate their impact. Research should capture these outcomes and more closely examine their role in mediating academic performance. In light of this, Hoagwood and colleagues recommend the following outcomes as particularly promising to include in intervention studies: *school climate*, *school engagement*, and/or *school bonding* (Hoagwood et al., 2007). Preliminary findings (to date) suggest that these are important, but often overlooked, indicators of academic success.

The literature on Cognitive Behavioral Therapy (CBT) is helpful in understanding the relationship amongst thoughts, attitudes, and behaviors. As originally outlined by Beck, the CBT model asserts that changing thoughts is one means of changing behavior. This relationship has implications for functioning in school. A 2006 study of a CBT-based stress management intervention (SMI) suggested that changes in *student attitudes* mediate academic and mental health improvement (Keogh, Bond, & Flaxman). Results showed that *dysfunctional cognitions* (i.e., worrisome thoughts) mediated improvements in mental health, while gains in performance on a standardized exam were mediated by changes in student *motivation*. These observed mediation effects suggest that student attitudes (such as classroom motivation) may facilitate academic improvement in the context of a CBT-based mental health intervention.

ENGAGEMENT

In their chapter on social, emotional, and academic learning, Christenson and colleagues assert:

> Engagement at school and with learning provides a foundation for academic persistence, adjustment, and performance, especially for students at risk of educational failure … If our goal is to foster school success, social and emotional learning that facilitates desired academic outcomes should be addressed explicitly and effectively" (Christenson & Havsy, 2004).

There is compelling empirical evidence that engagement in school is positively correlated with academic achievement. One difficulty in this literature, however, has been inconsistent definitions of *engagement* as a construct. A conceptual review of *engagement* describes it as a multifaceted and multi-component construct that incorporates three dimensions within it: a cognitive one, a behavioral one, and an emotional one (Fredricks, Blumenfeld, & Paris, 2004). Given its wide scope, engagement overlaps significantly with other, more specific empirical constructs. Engagement in an *emotional* sense involves attitudes towards school, such as feelings of belongingness and safety, or motivation for learning. A *behavioral* dimension (at its most basic) refers to whether a student is engaged with an academic task at hand (i.e., on-task/off-task), or the degree of effort and persistence he/she exhibits more generally. Finally, *cognitive* engagement in the classroom can involve degrees of motivation and self-control, concepts that are rigorously defined in the instructional literature. Essentially, classroom engagement constitutes how students think, feel, and behave in the classroom. *Figure 2* (below) is one researcher's attempt to describe specific indicators for subtypes of engagement (Macklem & Anderson, 2016).

Engagement Subtypes

Academic	Behavioral	Cognitive	Psychological
getting good grades	attendance	investment in learning	resilience
being promoted	getting to class on time	believing in need for school	persistence when working
graduating	completing homework	paying attention	belonging
	following rules	self regulation	motivated
	participating in class	setting goals for oneself	positive attitude

Figure 1. Indicators of Classroom Engagement.

Fredericks and colleagues argue that engagement can be an incredibly useful construct despite its definitional difficulties. While its all-encompassing scope may be viewed as redundant on the one hand, it can provide for a richer, more dynamic understanding of positive functioning. The authors argue that incorporating all these components together creates a useful 'meta' construct that describes overall school functioning and how it responds to factors in the environment (Fredricks et al., 2004). Furthermore, the multi-dimensional nature of engagement reflects the relationships that dimensions have with one other (i.e., cognitive engagement predicting behavioral or academic). Given these advantages, engagement appears to be a useful construct for examining the range of an intervention's effects on school functioning.

Chapter 2: Trauma: A Public Health Priority

PREVALENCE

Findings indicate the startlingly high prevalence rates for child and adolescent exposure to violence. An examination of the National Comorbidity Survey (Adolescent Supplement) found that a majority (61.8%) of youth ages 13-17 experience a potentially traumatic experience (PTE) within their lifetime (McLaughlin, Koenen, Hill, Petukhova, Sampson, Zaslavsky, & Kessler, 2013). Adolescents not living with both biological parents, and those with behavior disorders, were more likely to experience a PTE, especially interpersonal violence.

In a nationally representative telephone survey of 4000 families with youth ages 0 to 17, the rate of physical assault during 2013-2014 was estimated at 37.3% (Finkelhor, Turner, Shattuck, & Hamby, 2015). Nine percent of those surveyed reported youth exposure to an assault-related injury, 15.2% to caregiver maltreatment, and 5.8% to the witnessing of assault between parents. Among adolescent girls ages 14-17, 4.6% reported experiencing a sexual assault. Children and adolescents are exposed to violence, crime, and abuse at significant rates.

Also problematic are the rates of multiple trauma experiences over the course of childhood and adolescence. Survey data from the *National Child Traumatic Stress Network* indicated that, amongst youth who reported trauma exposure, 77% had experienced more than one type of trauma, 27% three to four types of trauma, and 31%

five or more types (Briggs, Fairbank, Greeson, Layne, Steinberg, Amaya-Jackson, . . . Pynoos, 2012). These figures are especially worrisome considering research on the compounding negative effects of trauma.

IMPACT

The negative sequelae of childhood trauma are well documented. Many studies have linked childhood trauma with a host of emotional and behavioral problems, which themselves lead to significant psychosocial impairment. One study examined internalizing and externalizing symptoms in a large clinic-referred sample of youth (ages 1½-18) with trauma exposure (Greeson, Briggs, Layne, Belcher, Ostrowski, Kim, … Fairbank, 2014). As measured on the *Child Behavior Checklist* (CBCL), nearly 30% of the sample exhibited clinical levels of aggression (*Aggressive Behavior* subscale) and 23% clinical levels of depression (*Withdrawn/Depressed* subscale). In terms of behavior, 25% of the sample exhibited rule breaking and 20% significant social problems. A key finding of this study was of a dose-response relationship between the number of trauma types experienced and clinical symptoms on the CBCL (Greeson et al., 2014). As trauma exposure accumulates, youth are increasingly likely to experience clinically significant emotional and behavioral problems.

Given the degree of emotional and behavioral impairment associated with exposure to trauma, it is no surprise that negative academic consequences also result. One study found that exposure to violence was significantly related to IQ and reading ability. Predictions from the regression equation indicated that a child experiencing violence

exposure and related distress would be expected to have as much as a 7.5-point reduction in IQ and 9.8-point reduction in reading achievement (Delaney-Black, Covington, and Ondersma et al., 2002). Specific impacts on school functioning have also been found. In one study, exposure to community violence was associated with poor academic performance as measured by Grade Point Average (GPA) and scores on the *Scholastic Achievement Test* (SAT) (Schwartz & Gorman, 2003). According to their model, this relationship was mediated by symptoms of depression and disruptive behavior.

POST-TRAUMATIC STRESS DISORDER

It has been well established that youth exposed to violence are at greater risk for developing clinical disorders including depression, anxiety, and Post-Traumatic Stress Disorder (PTSD). Results from the National Comorbidity Survey found a 4.7% lifetime prevalence of PTSD (McLaughlin et al., 2013). The probability of developing PTSD was highest for potentially traumatic events involving interpersonal violence. Other predictors of PTSD-vulnerability for adolescents exposed to such events included being female, experiencing prior traumatic exposure, and having a pre-existing stress-related disorder. Poverty and repeated trauma exposure after onset of PTSD predicted non-recovery.

There have been various estimates of the percentage of children who develop PTSD after exposure to a potential trauma. In a clinic-referred sample in the urban Northeast, participants had been exposed (on average) to 4.9 different types of potentially trauma events in their lifetime. Nearly one-quarter ended up developing PTSD (Crusto, Whitson, Walling, Feinn, Friedman, Reynolds, … Kaufman, 2010). Other estimates

suggest that rates of PTSD are around 16% among adolescents who have experienced adverse events, with higher averages among girls who had experienced interpersonal adversity (33%) (Alisic, Zalta, Wesel, van Larsen, Hafstad, Hassanpour, & Smid, 2014). For youth who do develop PTSD, all domains of functioning become impaired.

According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association [APA], 2013), PTSD is characterized by the following symptom categories: intrusion (i.e., re-experiencing); avoidance; negative cognitions/beliefs about the trauma (i.e., fear, shame); negative emotional state (i.e., loss of interest and participation, social withdrawal); alterations in arousal and reactivity (i.e., vigilance, poor concentration, startle response, sleep difficulty). Symptoms must be evident for one month (or longer), and functioning impaired across settings. In children specifically, PTSD can come out in repetitive play expressing trauma themes, re-enactment of trauma, and/or nightmares without recall.

PTSD can have an array of presentations across individuals. For some, fear-based re-experiencing dominates, and displays of emotional and behavioral problems are evident (i.e., vigilance, startle response). Others experience an acute loss of interest, depressive mood, and negative cognitions. For some, high arousal and reactive-externalizing symptoms are prominent (i.e., unprovoked aggressive behavior, recklessness) (APA, 2013). Often, PTSD manifests as a combination of these and presents as internalizing and/or externalizing behaviors. Dissociative symptoms, such as detachment and derealization, can be a feature of any of these presentations.

Children with PTSD often have a heightened sensitivity to potential threats in their environment, especially those related to the trauma (APA, 2013). They may be jumpy, highly reactive, and quick to have a startle response. Difficulties with concentration are often reported (i.e., forgetting things), as are difficulties with sleep (due to high arousal or nightmares). It is clear from this description that PTSD will significantly impair a child's ability to function in the classroom.

PTSD can occur along with Oppositional Defiant Disorder (ODD), Separation Anxiety Disorder (SAD), or major neurocognitive disorder (APA, 2013). Higher rates of PTSD are reported among U.S. Latinos, African Americans, and American Indians. Environmental risk factors include lower SES, childhood adversity (economic depravation, family dysfunction, parental separation), lower intelligence, and minority status. Social support is a protective buffer.

EVIDENCE-BASED TREATMENT

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) is widely considered the gold standard for treating the psychological effects of trauma (Child Welfare Information Gateway, 2012). Empirical evidence supports its effectiveness at reducing symptoms of PTSD as well as associated negative emotional and behavioral responses. Based on theories of learning and cognition, TF-CBT addresses distorted beliefs, strong emotions, and negative attributions arising from the trauma (the *cognitive* piece) (Child Welfare Information Gateway, 2012). Additionally, it offers a supportive, healing environment through which the child explores and integrates the trauma memory (the

behavioral piece). As part of TF-CBT, parents learn skills to cope with their own distress and to support their child's therapeutic progress.

The Cognitive Model

A well-established model of PTSD outlines how negative cognitions (appraisals of the trauma) contribute to a pervasive state of perceived 'threat' across environments and situations (Ehlers & Clark, 2000). Such chronic fear leads to strong negative emotions and maladaptive coping strategies, all of which further propel the cycle of negative cognitions and perceived threat. Findings have lent support for this cognitive model of trauma. For example, a study of mechanisms implicated in TF-CBT indicates that *cognitive change* (resulting from re-appraisals of the trauma memory) *precedes* symptom reduction in those affected by PTSD (Kleim, Grey, Wild, Nussbeck, Stott, Hackmann, … Ehlers, 2013). This finding lends support to the role of cognitive change—a main target of CBT—as an active therapeutic mechanism producing symptom change.

As this cycle unfolds over time, it can fundamentally affect key aspects of healthy functioning, such as the ability to regulate emotions and behavior. The literature on complex trauma outlines a range of impairments youth may experience, many of which affect regulatory and control processes. Seven domains have been implicated, four of which include *affect regulation*, *behavioral regulation*, *cognition*, and *self-concept* (Cook, Spinazzola, Ford, Lanktree, Blaustein, Cloitre, … Van der Kolk, 2005). In terms of the cognitive effects over time, exposure to trauma can reshape how beliefs about the self and world are constructed, leading to self-blame, poor self-concept, and feelings of

worthlessness/hopelessness. These findings make clear how PTSD upsets some of the most essential processes for learning, development, and socialization.

BRINGING TREATMENT INTO SCHOOLS

There is a well-known need for programs that address the effects of childhood trauma. As discussed above, researchers and agencies have specifically highlighted the advantages of housing these programs in the school setting (U.S. Department of Health and Human Services, 1999). According to Hoagwood, "As the long-term impact of trauma, anxiety, and depression have been well documented, neglect of intervention programs in schools that can specifically address these issues is especially worrisome" (Hoagwood, et al., 2007, p. 89). A review of school-based trauma programs concludes that CBT-based interventions demonstrate the highest clinical impact compared with other program modalities (i.e., play therapy, mind-body skills, etc) (Rofsnes & Idsoe, 2011).

An Empirically Supported Intervention

Program Description. The *Cognitive Behavioral Intervention for Trauma in the Schools* (CBITS) is a standardized CBT-based group intervention developed for delivery by mental health clinicians in a school setting (Stein, Jaycox, Kataoka, Wong, Tu, Elliot, & Fink, 2003). The CBITS intervention was designed for use with students in 5th through 12th grade who have witnessed or experienced traumatic life events and/or who are experiencing moderate to severe levels of PTSD symptoms. Designed for use with

diverse student populations, CBITS allows significant flexibility for cultural adaptations. Conducted in a small-group format over ten weekly sessions, CBITS employs a variety of didactic and interactive components to cover evidence-based cognitive behavioral techniques found to be effective at treating trauma symptoms (Stein et al., 2003). CBT techniques including psychoeducation, relaxation, cognitive restructuring, and exposure target symptoms of PTSD and related internalizing symptoms. The first half of the program focuses on particular CBT skills and content, while the second half involves exposure to the traumatic event and creation of a narrative.

Age-appropriate examples and individualized weekly homework assignments emphasize the application of techniques to students' lives (Stein et al., 2003). In addition, one to three individual sessions are worked into the protocol at designated time points so students are fully supported in the exposure process. Two parent sessions are offered to provide education about trauma and an orientation to the strategies taught in the program. A teacher session provides similar program background as well as suggestions for how teachers can best support these students in the classroom (Stein et al., 2003). With training offered for free online, and a low-cost clinician manual, CBITS is readily accessible and user-friendly. The clinician manual contains lesson plans, worksheets, and implementation guidance, while the website offers additional resources such as virtual consultation, evaluation tools, and a trauma screener with guidelines for use (CBITS | Home). Support for implementation fidelity is also offered, along with a developer-created measure to assess fidelity.

Development. The CBITS intervention was developed, implemented, and evaluated using a community partnered participatory research approach (CPPR). From the beginning, community partners were a crucial voice in determining program components, and they continued to be a part of the evaluation process, helping to shape the research questions, implement the study, and interpret findings (Stein, Kataoka, Jaycox, Wong, Fink, Escudero, & Zaragoza, 2002). It is likely that this ecological approach played a key role in CBITS's success. CBITS has been found to 'fit' within the school-community framework and includes features associated with intervention adoption, such as compatibility with school practices, advantages over 'usual care,' and ease of use (Kataoka, Jaycox, Wong, Nadeem, Langley, Tang, & Stein, 2011). In this way, CBITS is a truly innovative model of how SBMH can embody 'best practices' identified in the research, while also achieving ecological validity that promotes its sustained use over time.

Evaluation. The initial evaluation of CBITS represented the first randomized controlled trial of a trauma intervention for students exposed to violence experiencing symptoms of PTSD (Stein et al., 2003). It was originally implemented in two middle schools within the Los Angeles Unified School District (LAUSD) through collaboration with local university-based researchers. Students were randomized into the standard 10-session CBITS group (n=61) or a delayed intervention group (n=65). Results from this trial demonstrated significant post-intervention reductions in symptoms of PTSD and depression (with effect sizes of 1.08 SDs and 0.45 SDs respectively), as well as improved psychosocial functioning and parent-rated behavior.

A randomized trial comparing CBITS with individual TF-CBT delivered in a clinic setting found that 91% of participating youth completed the school program while only 15% completed the individual clinic-based treatment (Jaycox, Cohen, Mannarino, Walker, Langley, Gegenheimer, & Schonlau, 2010). The study was conducted with (predominately) African American victims of Hurricane Katrina. These findings indicate that CBITS is a more convenient and accessible treatment modality for students. Two studies of CBITS with Latino youth demonstrated positive clinical outcomes, as well as teacher-reported academic improvement (Kataoka, Stein, Jaycox, Wong, Escudero, Tu, … Fink, 2003; Kataoka et al., 2011).

The most recent evaluation of CBITS directly addressed academic outcomes and demonstrated improvements in student grades (Kataoka et al., 2011). This study used data from the original 2003 trial of CBITS and examined grade changes of participating students three months following the intervention. Findings suggested that participation in CBITS was associated with increases in academic achievement scores after a follow-up period. These results add a great deal of support to the potential impact of programs like CBITS to concretely reflect academic change.

Dissemination. Extensive research on CBITS has established a strong empirical base and contributed to its widespread implementation across the U.S. (14 states) and abroad (4 countries) (CBITS | Learn-more). Primarily used with at-risk communities in urban areas, CBITS is recognized as a culturally appropriate intervention for youth with trauma exposure. Adaptations to CBITS have been made for use by nonclinicians (teachers) and with Spanish-speaking, low-literacy, and foster care populations (CBITS |

Learn-more). CBITS has been recommended as a mental health intervention by entities such as the *Centers for Disease Control*'s Prevention Research Center, the *Substance Abuse and Mental Health Services Administration's* National Registry of Evidence-Based Programs and Practices (NREPP), and the *U.S. Department of Justice's* Office of Juvenile Justice and Delinquency Prevention (CBITS | Learn-more). Actively disseminated through SAMHSA, CBITS has been successfully implemented for years at public schools in Baltimore, Madison, New Orleans, and Los Angeles (CBITS | Success-stories).

SELECTED OUTCOMES

In light of the findings reviewed herein, the proposed study will include a careful selection of classroom-relevant outcomes and employ a multi-method, multi-informant reporting approach. The original CBITS study focused mainly on clinical outcomes (PTSD and depression symptoms), and while it used one classroom behavior indicator—a teacher rating scale—no difference was found post intervention (Stein et al., 2003). Closer inspection of the measure selected, however, brings up questions about its sensitivity to detect meaningful change. At 6-items, it was at the very least too short to be an adequate standalone measure of behavior change. The proposed study will therefore include a more comprehensive emotional and behavioral reporting system, using measures sensitive enough to capture the kind of behavior changes that would be evident at intervention completion (i.e., 10 weeks). Given the range of impairments associated with PTSD, it is important to capture this full range when examining changes.

Similar to prior trials of CBITS, a self-report measure will be used to assess trauma exposure and PTSD symptoms. While the clinical outcome is not the main one under study, it is included here to ensure that the treatment has the intended effect on mental health (i.e., its purported target). Of primary interest, the proposed study will include three measures that assess different aspects of social, cognitive, and behavioral functioning in the classroom: a self-report of student engagement, a rating scale of classroom behavior, and a direct, independent observation of classroom behavior. A thorough review of available measures was undertaken to find one that minimized burden (i.e., was feasible to learn and use) and cost (accessible training and moderate rating time), while remaining sensitive to the kinds of behavior changes expected through CBT treatment with this population.

Attention was paid to selecting measures with 'face validity' to teachers. To this end, the investigator selected a behavior rating scale specifically designed for use by teachers in the classroom. This meant that gold-standard rating scales used in clinical research, such as the *Child Behavior Checklist*, were not considered despite their excellent psychometric properties. This decision was made in light of research reviewed herein calling for SBMH research to better align with educational language and priorities (Hoagwood et al., 2007).

SUMMARY

An examination of the literature on school-based mental health highlights a significant research gap. Despite empirical support linking socio-emotional and academic

functioning, this relationship has not been fully explored in the context of school-based mental health interventions. There is an urgent need for programs to address childhood trauma. Given the advantages of schools as delivery settings, it is imperative for funding and dissemination that existing empirically supported treatments demonstrate their impact on day-to-day student functioning. Since education has traditionally viewed mental health as beyond its scope, the onus is on school-based MH research to align with the broader educational mission of schools, specifically by addressing ways that it reduces *barriers to learning* (Hoagwood et al., 2007; Atkins, Hoagwood, Kutash, Seidman, 2010).

In addressing mental health treatment, school-based programs ultimately facilitate learning and academic success. To fully establish this outcome, however, closer examination must be paid to mechanisms by which program components work to affect student functioning. The bulk of SBMH research to date fails to include academic outcomes, and when it has, outcome selection has been heterogeneous and inconsistent. It may be the case that traditional achievement measures (i.e., grades, test scores) are not capturing full program impact. The educational and SBMH literature suggests that more promising outcomes may be those that explore aspects of classroom context and/or discrete student behaviors that are predictive of academic success.

There is a clear imperative for SBMH to better document its impact on educationally relevant student outcomes. At the same time, there is substantial need for evidence-based treatments that serve populations most at-risk for psychological problems related to trauma exposure. The proposed study uses an empirically supported school-

based treatment for addressing posttraumatic stress, and examines its effects on a targeted range of academic outcomes that have been understudied in the literature to date, but which represent important classroom variables likely affected by treatment. The proposed design generally replicates that of the original intervention trial, which was recommended as "particularly good" in a leading review of school-based programs for trauma (Rolfsnes & Idsoe, 2011). Findings from this study will shed light on potential mechanisms by which social, emotional, and behavioral functioning foster student learning and school performance.

Chapter 3: Proposed Study

Statement of Problem

Given the prevalence and negative impacts of trauma discussed previously, this lack of attention by schools is a serious oversight. Findings suggest that as many as 40% of inner-city youth have witnessed a stabbing or shooting (U.S. Department of Health and Human Services, 2001), putting them at increased risk for a range of psychological problems. The psychological and behavioral effects of trauma are significant, as are its long-term disruptions to developmental trajectories over the lifespan. While all psychological problems interfere to some degree with daily functioning, the breadth and severity of trauma-related functional impairments may be significantly more disruptive to student academic and classroom functioning.

Students who are experiencing symptoms of PTSD face significant obstacles to performing and achieving at their academic potential. Moreover, the social, emotional, and behavioral impairments associated with PTSD diversely manifest in the classroom through externalizing behaviors (i.e., aggression, disruption) and/or through internalizing problems (i.e., withdrawal, disengagement, poor concentration) (APA, 2013). It follows, therefore, that intervention to help these students understand and manage their distress—cognitively, affectively, and behaviorally—can go a long way towards improving their functioning in the classroom.

PURPOSE OF CURRENT STUDY

The purpose of the current study is to examine the impact of a school-based trauma intervention (CBITS) on academically meaningful outcomes for a sample of urban minority students who have witnessed or experienced violence and are experiencing posttraumatic stress. Findings have demonstrated that participation in the CBITS intervention is associated with significant reductions in PTSD and depression symptomatology. Based on the substantial evidence linking socio-emotional and academic functioning, the proposed study will include outcome variables that have been used with success in the education literature, and that represent targets of change in Cognitive Behavioral Therapy. The changes brought about through CBT will manifest in the classroom as improvements in key student attitudes and behaviors. This impact may be especially evident in youth suffering with PTSD, given its particularly negative social, behavioral, and academic effects.

The proposed study generally replicates that of Stein et al.'s original trial of CBITS (2003), which has received attention for its strong design, high treatment impact, and ecological validity in the schools. Deviating slightly in its approach to outcome selection, this study takes into account recommendations from the literature (Hoagwood et al., 2007), and targets classroom-based social, emotional, and behavioral variables most likely impacted by CBITS. Furthermore, given the variety of functional impairments associated with PTSD, the proposed study includes a comprehensive emotional and behavioral reporting system. It uses measures that are more teacher-friendly, and whose constructs better align with the language and priorities of the

educational system. Using a multi-method approach, the proposed study addresses the following student outcomes: PTSD symptom relief; social behavior and competencies in the classroom; and, engagement in the classroom learning environment. Compared with those used in the original CBITS trial, the proposed outcomes may be more sensitive to capturing the kinds of improvements these students experience after participation in CBT.

METHOD

Research Questions and Hypotheses

Research Question 1. At post-treatment, will students in the intervention group (CBITS) report lower levels of PTSD symptoms on the *Child Post-Traumatic Stress Disorder Symptom Scale* (CPSS) compared with students in the waitlist control (WC) group?

Hypothesis 1. At post-treatment, self-reported post-traumatic stress symptoms on the CPSS will be lower for students in the intervention group than for students in the waitlist control group after accounting for baseline scores and covariates.

Rationale. The CBITS intervention has a strong empirical base as evidenced by rigorous outcome studies (Stein et al., 2003; Kataoka et al., 2003; 2011; Jaycox et al., 2010) and status as a recommended mental health intervention by foremost authorities such as the *National Child Traumatic Stress Network* (NCTSN) and the *Substance Abuse and Mental Health Services Administration* (SAMHSA). Randomized controlled trials of CBITS using similar samples have repeatedly demonstrated its significant clinical impact, with reductions seen in both PTSD and depression symptoms (Stein et al., 2003;

Kataoka, 2003; 2011; Jaycox et al., 2010). The current study replicates many methodological and design features of successful RCT's of CBITS. It includes similar sample demographics, the same clinical outcome measure, and near identical study procedures. Given that a 2003 trial of CBITS evidenced a moderate-to-large impact on PTSD symptoms, similar findings can be expected here, especially given the attention to control features, power, and fidelity.

Research Question 2. At post-treatment, will teachers of students in the intervention group (CBITS) report better classroom behavior on the *School Social Behavior Scale* (SSBS) compared with teachers of students in the waitlist control (WC) group?

Hypothesis 2. At post-treatment, teacher ratings of classroom behavior on the SSBS will be higher for students in the intervention group than for students in the waitlist control group after accounting for baseline scores and covariates.

Rationale. According to the *National Child Traumatic Stress Network*, children who have been traumatized can experience poor emotional control, impulsive behaviors, intense reactions (i.e., blowing up, fighting), and difficulties with concentration and problem solving, all of which can affect classroom behavior and impair learning (Steinberg, Pynoos, Briggs, Gerrity, Layne, Vivrette, … Fairbank, 2014). TF-CBT, which works directly on these symptomatic behaviors, is a highly effective treatment modality for PTSD. From a mechanism standpoint, TF-CBT targets the kinds of attitudes (i.e., poor self-concept, self-blame) and behaviors (i.e., aggression, disengagement) that are affected by PTSD and that interfere with healthy classroom functioning.

Literature has established the negative correlation between exposure to violence and academic achievement (Schwab-Stone et al., 1995; Schwartz & Gorman, 2003). Various mediators of this relationship have been examined, such as the role of emotion regulation, intrusive thinking, and internalizing/externalizing problems. Internalizing and externalizing symptoms have been shown to interfere in general with academic functioning (Weeks, Ploubidis, Cairney, Wild, Naicker, & Colman, 2016; Moilanen, Shaw, & Maxwell, 2010), as well as in cases of PTSD specifically (Delaney-Black et al., 2002; Henrich, Schwab-Stone, Fanti, Jones, & Ruchkin, 2004). The literature on TF-CBT suggests that increased emotion regulation mediates treatment improvement (Thornback & Muller, 2015). The skill building and exposure practice of TF-CBT has been shown to lead to decreases in *maladaptive* forms of emotion regulation (Thornback & Muller, 2015). In this way, TF-CBT helps children learn better ways of regulating their emotions and behavior. For example, when children construct a trauma narrative, they are practicing how to proactively regulate themselves in the moment. As regulatory skills are crucial in meeting the emotional and behavioral demands of school, CBT treatment will ultimately improve student classroom behavior.

Research Question 3. At post-treatment, will objective behavior ratings for students in the intervention group (CBITS) as rated on the *Behavioral Observation of Students in Schools* (BOSS) be higher than ratings for students in the waitlist control (WC) group?

Hypothesis 3. At post-treatment, objective behavior ratings on the BOSS will be higher for students in the intervention group than for students in the waitlist control group after accounting for baseline scores and covariates.

Rationale. As a social-emotional assessment method, and for externalizing problems specifically, behavioral observation is considered a gold-standard method (Whitcomb & Merrell, 2012). However, due to their higher cost and time commitment, independent observations are rarely included in intervention studies (Hoagwood et al., 2007). Studies that do employ this method, however, capture significant improvements in disruptive behavior over the course of the intervention, improvements that are not always apparent from teacher ratings alone (Bloomquist, August, & Ostrander, 1991). In fact, evidence from one school-based intervention trial suggested that behavioral observations were *more sensitive* than rating scales to changes in prosocial and/or disruptive behaviors, which were targets of the intervention (Bloomquist et al., 1991). By increasing sensitivity in this way, the inclusion of the BOSS increases the likelihood that changes in behavior (associated with participation in CBITS) will be captured.

As a measure, the BOSS has been recommended as a good baseline from which to assess intervention effects or to confirm/disconfirm more subjective teacher ratings (Shapiro, 2011). It generates empirical data on student behaviors that are associated with trauma symptoms (i.e., disruptive, antisocial, or detached behaviors). It also gets at key indicators of *student engagement*, distinguishing between *engagement* vs. *non-engagement* behaviors, and those that are *active* vs. *passive* in nature. The specificity of

data this measure captures allows for a more detailed understanding of how CBITS (and similar CBT interventions) bring about improved functioning in school.

Research Question 4. At post-treatment, will students in the intervention group (CBITS) report higher levels of academic engagement on the *Motivation and Engagement Scale* (MES-Junior) compared with students in the waitlist control (WC) group?

Hypothesis 4. At post-treatment, self-reported academic engagement on the MES will be higher for students in the intervention group than for students in the waitlist control group after accounting for baseline scores and covariates.

Rationale. Highly researched in the educational literature, student engagement is a construct that has been directly linked with academic achievement-related outcomes (i.e., standardized tests, grades) (Fredricks, Blumenfeld, & Paris, 2004). It has been a focus of researchers and policymakers as a key target for addressing low achievement, alienation, and dropout. A variety of student engagement measures have been developed, many of which have been shown to correlate positively with achievement and negatively with drop out (Fredricks et al., 2004; Fredricks, 2011). Engagement has gotten even more attention amid high-stakes testing accountability, and school reform models have been developed that target it specifically. In Hoagwood's 2007 review of SBMH outcomes, indicators of student engagement were cited as promising outcomes of school-based mental health interventions. They are also recognized and valued by the educational field, and as such, represent opportunities to showcase the benefits of mental heath interventions in the schools.

Improved engagement as a result of participation in CBITS makes sense in the context of the CBT model. Engagement is highly related to the specific cognitive and affective processes targeted in CBT treatment for trauma. Internalizing symptoms of PTSD, such as inattention, detachment, and anhedonia, imply a state of *disengagement* with the environment (in this case, the classroom). It follows, therefore, that intervention for these symptoms would improve engagement through increasing participation, focus, and overall activity.

Participants

The proposed study will include 160 sixth grade students and five school-based mental health clinicians across two large middle schools in a school district in the Southwest region of the U.S. Results of the preliminary power analysis indicated a minimum sample size of 155 students (alpha = 0.0125; beta = 0.8), and five have been added in case of attrition or missing data. Mirroring that of Stein et al.'s 2003 trial of CBITS, the proposed sample represents students at greatest risk for exposure to violence: urban, economically-disadvantaged minority youth. English-speaking students will be eligible for the study if they endorse substantial violence exposure on the *UCLA PTSD Reaction Index for DSM IV* (UCLA PTSD-RI), post-traumatic stress symptoms in the *at-risk* range on the *Child PTSD Symptom Scale* (CPSS), and appear to clinicians and teachers as able to behave appropriately in a small-group therapy format (i.e., willing to speak about personal experiences and not be overly disruptive). If a student is receiving outside therapy services, or is on medication for a mental health condition, he or she must

have been receiving the services and/or taking the medication for at least one month prior to the start of the intervention. The investigator will note and record changes in outside services or medication throughout the intervention.

Five school-based mental health clinicians are needed to run the intervention groups in an ideal implementation. As there will be 10 intervention groups total (5 per school), this would mean that each clinician would lead two groups over the semester. Eligible clinicians include school staff members who are responsible for delivering psychological services at the school or district level. They may include guidance counselors, social workers, and/or school psychologists.

Additionally, at least one independent rater will be needed who has been trained on administration of the *Behavioral Observation of Students in Schools* (BOSS). Likewise, a coder who has been trained in the CBITS intervention will be needed to complete the CBITS fidelity monitoring procedure. The same person could serve in both rating capacities.

Measures

The proposed study will assess baseline and post-intervention levels on four main outcome variables: self-reported PTSD symptomatolgy, teacher-rated classroom behavior, independently-observed classroom behavior, and self-reported student engagement. A trauma exposure measure will be administered as part of the initial screening process. The investigator chose the following measures based on their robust psychometric properties and their use in prior CBITS trials.

Initial Screening

UCLA PTSD Reaction Index for DSM IV (PTSD-RI; Steinberg & Brymer, 2008; Steinberg, Brymer, Decker, & Pynoos, 2004). This self-report measure screens for exposure to traumatic events (12 items) and evaluates severity of PTSD symptoms (22-items) in children and adolescents. One of the most widely used and well-studied instruments of its kind, the PTSD-RI for *DSM-IV* has evidenced strong internal consistency reliability and test-retest reliability (r = .84) (Rodriquez, Steinberg, Saltzman, & Pynoos, 2001). Strong evidence of convergent validity has been demonstrated by high total score correlations with the *Posttraumatic Stress* subscale score of the *Trauma Symptom Checklist for Children-Alternative* (r = .80) (TSCC-A; Briere, 1996), and with the *Kiddie Schedule for Affective Disorders and Schizophrenia* (KSADS) (Cicchetti & Sparrow, 1981). It has likewise been validated on diverse samples across age, gender, culture, and trauma type (Hawkins & Radcliffe, 2006). In a recent large-scale analysis with a highly diverse sample (N = 6,291), the PTSD-RI for *DSM IV* demonstrated excellent internal consistency across age and race (alpha = .88 to .90). The 12-item trauma history portion of the index (i.e., the first part) will be used to screen for presence and degree of trauma exposure, as was done in a 2010 trial of CBITS (Jaycox et al., 2010).

Classroom Behavior

School Social Behavior Scale (SSBS-2; Merrell, 2002b). The SSBS is a school-based behavior rating scale used by teachers to assess social-emotional strengths and risk

behaviors exhibited by K-12 students in the classroom environment. It includes two separate scales that measure *Social Competence* (Scale A) and *Antisocial Behavior* (Scale B). Subscales of *Social Competence* include *Interpersonal Skills* ("Interacts with a wide variety of peers"); *Self-Management Skills* ("Shows self restraint"); and *Academic Skills* ("Completes assigned activities on time"). Subscales of *Antisocial Behavior* include *Hostile-Irritable* ("Will not share with other students"); *Antisocial-Aggressive* ("Gets into fights"); and *Disruptive-Demanding* ("Is difficult to control"). Teachers rate on a 5-point scale how often a particular student exhibits each behavior. T-scores are generated and can be categorized into four *Social Functioning Levels—High, Average, At-risk, High Risk*. At 64-items total, the SSBS is extensive enough to be reliable, but moderate enough to be practical and easy to use (unlike some of the more common behavior rating systems). Standardized on a nationally representative group of 2,280 students, the SSBS has demonstrated high internal consistency and split-half reliability (alpha = 0.91 to 0.98) and test-retest reliability by scale (kappa = 0.60 to 0.83) (Whitcomb & Merrell, 2012). Convergent and discriminant validity is evidenced by high correlations between the SSBS and five widely used behavior rating scales (including the *Child Behavior Checklist* and the *Conners Teacher Rating Scale*-39).

Behavioral Observation of Students in Schools (BOSS; Volpe, DiPerna, Hintze, & Shapiro, 2005). The BOSS uses a momentary time sampling procedure to track direct observational data of engagement in the classroom, a vital aspect of academic functioning. It assesses students (Pre-K-12) on two main categories of engagement, *on-*

task (defined as active engaged time [AET] or passive engaged time [PET]) and *off-task* (defined as a motor, verbal, or passive off-task behavior). Off-task behaviors represent student impulsivity, hyperactivity, and inattention. The BOSS was created for use by school psychologists to screen for academic risk, and for researchers to assess intervention effects. It should be noted that moderate training is required (10-15 hours) for proper administration of the BOSS; however, this is significantly less time than other established behavior measures (Steiner, Sidhu, Rene, Tomasetti, Frenette, & Brennan, 2013). Interobserver agreement reports of the BOSS have been high, with kappas reported by one study in the range of .93 to .98 (DuPaul, Volpe, Jitendra, Lutz, Lorah, & Gruber, 2004). A multiple-baseline study documented treatment sensitivity of the BOSS to changes in instructional modality among three students with ADHD (Ota & DuPaul, 2002). While convergent validity of the BOSS has not yet been documented, support for discriminant validity with ADHD populations has been collected (DuPaul et al., 2004). While the BOSS has been found reliable to users, further studies on its properties are warranted (Steiner et al., 2013).

Student Engagement

Motivation and Engagement Scale (MES-Junior School; Martin, 2009). The MES is a 44-item self-report measure assessing student motivation and engagement from the standpoint of adaptive and maladaptive cognitions and behaviors. It contains 11 subscales representing the following construct dimensions: *Self-belief, Learning focus, Valuing school, Persistence, Planning, Study management, Disengagement, Self-sabotage,*

Anxiety, Failure avoidance, and Uncertain control. Students rate (on a scale from 1 to 5) how applicable each statement is to their own academic experiences. Subscale scores are aggregated, converted to normed scores, and categorized by a letter grade based on how many standard deviations above or below the mean the score falls. The developer reports moderate to high internal consistency reliability across subscales (alpha = .70-.87). Likewise, confirmatory factor analysis demonstrates subscale-level construct validity, while correlations with academic outcomes indicate criterion-related validity. The MES was normed with 1,249 students aged 9-13 across 15 schools in Australia and has been used in multiple outcome studies (Martin, 2005; 2009; Liem & Martin, 2012). While this geographic specificity is a limitation, the measure was also validated on a U.S. sample of urban, economically disadvantaged, African American students (Howard, 2006).

Implementation Fidelity

CBITS Fidelity Checklist. A scale developed specifically for the intervention assesses the degree to which a clinician covers individual session components; ratings are made on a scale from 0 (*not covered at all*) to 3 (*group leader covers the topic thoroughly, integrating it into the larger context of therapy and in an interactive style)*. A 7-item measure assesses therapy quality in the session (low, moderate, high) as indicated by group member motivation and participation as well as therapist empathy. Trained, objective clinician raters complete both scales in conjunction with viewing randomly selected session audiotapes. No information was found on psychometric properties of the checklist.

Procedure

Recruitment

Schools in the Southwest will be recruited based on a zip code search for neighborhoods with elevated levels of community violence whose residents are primarily low-income minorities. School district(s) in the identified neighborhoods will be contacted and their (largest) middle schools recruited for the study. The investigators will present to the administrators the components of the CBITS program, its benefits, and its risks. Once two middle schools agree to participate, the study can proceed as described below.

Screening

In early September of the fall semester, parents of sixth-grade students at participating schools will be notified of the study and given consent for their child to participate in the screening process. The consent form will provide an overview of the study and description of what the screening process entails. Eligibility for study participation will be determined by a two-part screening process to be conducted by participating school clinicians at appointed times during the school day. To assess exposure to violence (first criterion), clinicians will orally administer the first 12 items from the UCLA PTSD-RI to participating students in a group format (25-30 students at a time). These items ask children to record the range of traumatic events they have experienced or witnessed, ranging from violence to natural disaster. Following

procedures in Stein et al., significant exposure to violence is defined as *being the victim or witness to violence involving a knife or gun* or, alternately, as having lifetime exposure to three or more traumatic events (Stein et al., 2003). Among a diverse group of children who had experienced at least one traumatic event (N = 6,291), results suggest that those in the ten-to-twelve age group have experienced an average of 3.3 traumatic events (*SD* = 2.0) (Steinberg, Brymer, Kim, Briggs, Ippen, Ostrowski, … Pynoos, 2013). For the purposes of identifying children with elevated PTSD symptoms, exposure at or above this average will be used to indicate at-risk status.

Students who meet the exposure criterion will then be screened for PTSD symptoms using the CPSS self-report questionnaire. The CPSS will also be orally administered by the clinicians to student groups (10 per group is recommended). Students will report how often they have been bothered by specific symptoms of PTSD over the past month on a scale from 0 (*not at all*) to 3 (*5 or more times a week*). As used in prior trials of CBITS, a score of 11 or more on the CPSS (indicating elevated symptom levels) qualifies a child to participate in the study (Jaycox et al. 2010; Kataoka et al., 2003). Lastly, school-based mental health clinicians will check in with teachers to informally assess whether the students' conduct does not prevent appropriate participation in a small-group setting (i.e., not too disruptive).

Study Consent

Once eligible participants have been identified, investigators will contact parents to obtain written consent for participation in the program; student assent will likewise be

solicited. In the consent process, families will be informed of the randomization procedures, risks and benefits of participating, limits of confidentiality, privacy safeguards, and a description of the intervention components. They will be notified that students placed in the waitlist control group will be eligible to receive the same services during the next academic semester (i.e., spring). Lastly, parents will be notified of the prerequisite in cases where the student is taking medication for a mental health disorder or receiving outside care (must be for at least one month). Based on Stein et al., there will likely be a significant portion of students meeting inclusion criteria who opt not to participate; this is especially the case given the sensitivity of the background and mental health issues being targeted.

Randomization

Participating students from both schools (N = 160) will be randomly assigned to the intervention cohort (CBITS) (n = 80, 40 per school), or to a waitlist control group (WC) (n = 80). Students in the intervention condition at each school (n = 40) will be further divided into five groups of eight students each, yielding a total of ten CBITS intervention groups across schools. Groupings can be made at the clinician's judgment based on type of trauma and/or severity of symptoms. See *Figure 1* for a flowchart of study protocol and timeline.

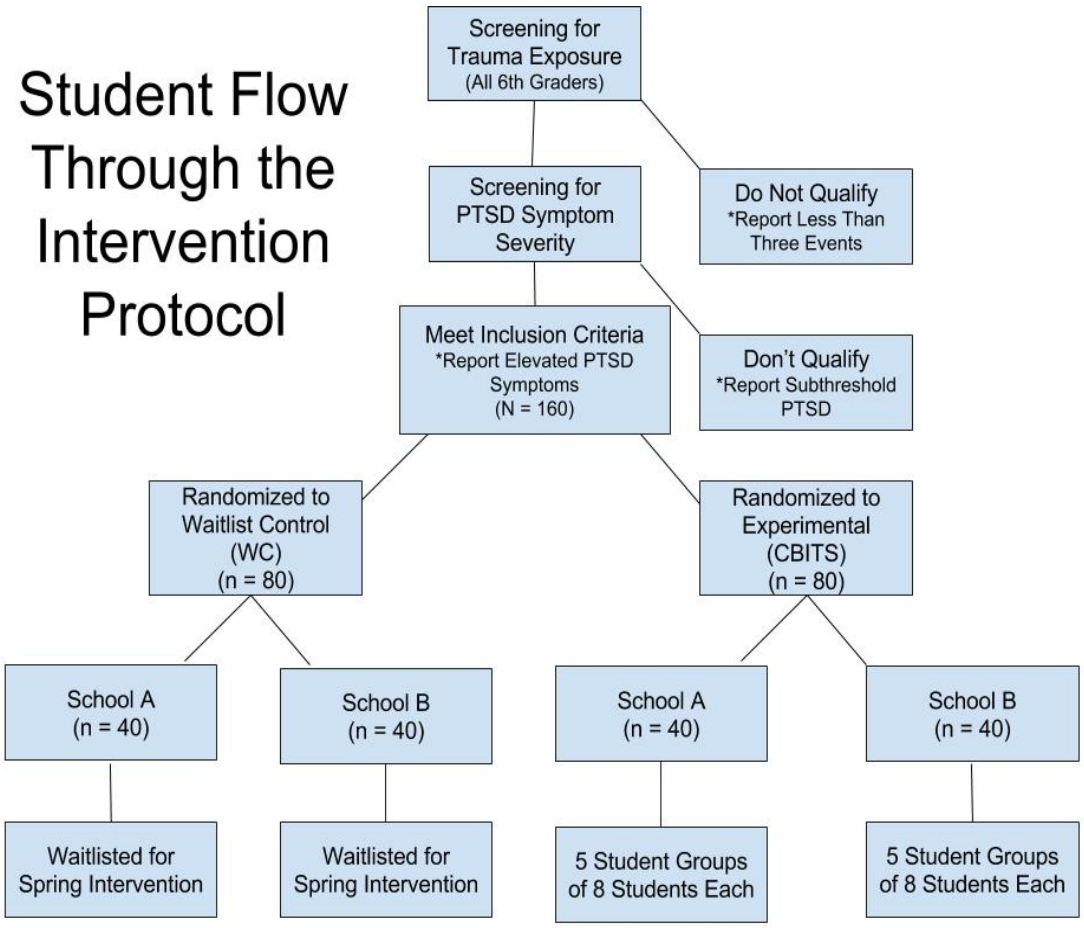

Figure 2. Study Flow Through the Protocol.

Data-collection

Demographic information will be obtained through a parent report questionnaire or through access to school records with parents' permission. Demographics of interest include: gender (M or F), ethnicity (Caucasian, Latino, African American, or Other), school site (A or B), free/reduced lunch status (Y or N), and special education status (Y or N). Information about participating clinicians (mental health degree, role at the school,

years at the school, and experience in field) will also be obtained through school records or a clinician questionnaire.

Clinical and academic outcome data will be collected prior to the intervention (baseline) and 10-12 weeks later at intervention completion (post). In an ideal timeline, the screening process would be complete by the middle of September, baseline data collected by October 1st, and an intervention start shortly thereafter. Allowing 10-12 weeks for the intervention course, post-data would then be collected in mid-December before winter break. This timeline would align with natural academic breakpoints (i.e., fall semester) and allow enough 'cushion' time given the frequently occurring barriers to research in the schools.

Measures of academic functioning will be administered at pre-and-post time points in the manner described. Clinicians will administer the self-report of engagement (MES) to each intervention group during a convenient 30-minute block of time in the school day. Teachers of participating students will likewise be given 30-minutes to complete a behavior rating form (SSBS) on each student (preferably with time carved out from other duties).

Administration of the BOSS will require the greatest resource expenditure of the outcome measures. It requires a trained observer and, depending on how much time the observer can devote, the entire administration process will likely take at least 2 weeks. Online training requires about 15 hours and is provided for free on the developer's website. Raters in the proposed study would take the training (self-paced) over the course of the proceeding summer. Each recording period for the BOSS takes 15-20 minutes, and

at least 3 observations per student taken on consecutive days are recommended. The developers provide a user-friendly manual that goes through step-by-step procedures and clearly operationalizes each behavioral code (Shapiro, 2011). A standard BOSS Observation Form is provided for recording. Alternately, an interactive Smartphone application of the BOSS for use with Android™ or Apple® devices can be used for more efficient administration. The application stores data and facilitates recording, timing, analysis, and interpretation.

It is recommended that observers familiarize themselves beforehand with the classroom layout and rules/expectations. After the observation, developers advise checking in with the teacher as to whether the observed behavior was 'typical' of the student. Observations should be chosen so as to represent different class formats and content areas as well as particular times or settings in which problems tend to occur for the student. These choices help ensure that the data generalizes to the student's overall academic functioning.

At the post-intervention collection point, students will be screened again on the UCLA PTSD-RI for *DSM-IV* to determine whether any new exposure to trauma has occurred over the course of the intervention. Interpretation of findings will take new exposure into account. Clinicians will also administer the CPSS at post point, as it is the main clinical outcome measure (given as part of the screening process at baseline).

Intervention Fidelity

Following intervention completion, around 20% of session recordings will be randomly selected and viewed by the independent rater to assess the extent of intervention completion. For each session viewed, the rater completes the CBITS *Fidelity Checklist Scale* (developed for the intervention) followed by a 7-item measure assessing therapy quality in session. Investigators will report completion percentages for each session as well as an overall mean completion rate. These results will be used as another lens in the interpretation of findings.

Intervention

The intervention will begin in late September and end in mid-December before the winter break. Participating school clinicians will be trained on the CBITS intervention as part of professional development (also known as in-service) at the beginning of the school year. The training will entail a two-day workshop led by clinical investigators and weekly supervision will be provided for support throughout the intervention course. If budget is prohibitive, clinicians can take the free online training and make use of website resources such as virtual consultation, or implementation and evaluation tools (CBITS | Home). All participating clinicians should have access to a CBITS administration manual that provides them with session plans, student worksheets, and implementation support. Clinicians will also need access to an audio recording device to record sessions for fidelity monitoring. Files should be uploaded to an encrypted drive, deleted from the device, and stored in a locked cabinet.

Each clinician (n = 5) will lead two intervention groups. A weekly meeting time of one class period will be determined through consultation with school personnel; ideally, groups would meet during a study hall period or right after school. As happened in the original study, scheduling can be flexible—even varying week-by-week—so as to minimize academic disruption. Clinical investigators will lead a weekly supervision with the school clinicians at a convenient time and place. Clinicians will be supported by guidance from the manual and with ongoing supervision support. They will lead ten sessions with student groups and one to three sessions with each student for individualized exposure practice (schedule is flexible, but ideally held after 2nd and 6th group session). In addition, they will lead two sessions for parents and one for teachers to educate them on trauma and individual strategies taught in the program.

The intervention period will wrap up before the winter break with adequate time allowed for post- data collection. Over the spring semester, clinicians will run the intervention again with students in the waitlist control group. The same procedures will be followed except for the trauma exposure screening (not necessary) and the collection of academic outcome data. For the sake of simplicity, only the CPSS measure will be administered at pre- and post- intervention points to ensure that students experience symptom relief.

Analyses and Expected Results

The proposed study uses a repeated measures design to examine post-score differences between the intervention (CBITS) and waitlist control (WC) groups across a range of outcome variables.

Preliminary Analyses

Power Analysis. A priori analysis using G*Power version 3.1.9.2 was conducted to establish the minimum necessary sample size to ensure adequate power to detect differences between groups. Results from this analysis indicated the need for 155 students in order to achieve 80% power to detect significant differences at an alpha level of 0.0125, given a medium effect size of $R^2 = .13$.

Tests of Assumptions. Upon completion of data collection and prior to hypothesis testing, preliminary analyses will be conducted to ensure that data conforms to assumptions of normality, linearity, and homoscedasticity. Descriptive statistics, frequencies, and histograms will be generated, and continuous variables examined for normality of underlying distributions. Scatterplots will be used to test linearity between independent variables and their expected values on each dependent variable. Finally, observed scores will be standardized into Z-scores and checked for outliers, defined as scores above or below 2 *SD*'s of the mean. Following the regression analysis described below, residuals will be checked for normality and homoscedasticity.

Covariates. Baseline scores on all dependent variables will be treated as

covariates and adjusted for in the model; this includes baseline scores on the CPSS, the SSBS, the BOSS, and the MES. Additionally, a priori analyses will be conducted to determine whether three of the independent variables (special education status, free/reduced lunch status, or school site*) need to be controlled for as well. For example, do special education versus general education students have significantly different post-scores on teacher-rated classroom behavior? Prior literature does not indicate systematic relationships between these three variables and the outcomes included in this study. For parsimony, these relationships will be tested beforehand and only included in the model as needed.

A two-sample *t*-test will be run on each dependent variable, for each independent variable, to test for differences between the groups defined by each independent variable. Any significant results would suggest that the variable should be added as a covariate to account for group differences. Since baseline scores on the dependent variables are already being controlled for in the model, differences in post-score measurements *between groups* would imply that groups responded differently to the treatment.

*Note: For the sake of parsimony, the proposed model is not controlling for clinician effects, but it is assumed that an overall effect of school site would take clinician effects into account by proxy. If significant, school site will be controlled for in the final model.

Predictors. The main predictor of interest in this study is condition (CBITS vs. WC). Prior literature suggests differences in PTSD symptoms by gender and ethnicity,

and past trials of CBITS have included them as predictors. Given the possibility that gender and ethnicity may explain some variance in post-scores, they will be included as predictors in the proposed model.

Baseline Characteristics. Baseline differences between treatment groups will be examined for all variables. A Chi-Square test will be used to assess treatment group differences on categorical variables (gender, ethnicity, special education, and free/reduced lunch status). A series of two-sample *t*-tests will assess treatment group differences between school sites on baseline scores of the CPSS, the SSBS, the BOSS, and the MES. No differences between groups are hypothesized since randomization to condition has theoretically controlled for pre-existing differences.

Tests of Research Questions

A linear multiple regression design will be used to evaluate Research Questions #1, #2, #3 and #4.

Research Question 1. After adjusting for covariates and baseline CPSS scores, will students in the intervention group (CBITS) have significantly lower post-treatment scores on the CPSS than those in the waitlist control (WC) group?

Statistical Hypothesis 1. Study condition will significantly predict post-treatment CPSS scores after controlling for all covariates, including baseline scores on the CPSS. This hypothesis will be analyzed using linear regression, regressing CPSS scores at post-treatment on study condition (CBITS or WC), controlling for baseline scores on the

CPSS as well as covariates identified a priori. Gender and ethnicity will be included as control variables in the model. A significant result in the hypothesized direction (CBITS < WC) would suggest that participation in the CBITS intervention is associated with PTSD symptom relief.

Research Question 2. After adjusting for covariates and baseline scores on the CPSS and the SSBS, will students in the intervention group (CBITS) exhibit significantly better classroom behavior as rated by their teachers on the SSBS than those in the waitlist control (WC) group?

Statistical Hypothesis 2. Study condition will significantly predict post-treatment SBSS scores after controlling for all covariates, including baseline scores on the SBSS and the CPSS. This hypothesis will be analyzed using linear regression, regressing SSBS scores at post-treatment on study condition (CBITS or WC), controlling for baseline scores on the CPSS and the SSBS, as well as covariates identified a priori. Gender and ethnicity will again serve as control variables in the model. A significant result in the hypothesized direction (CBITS > WC) would suggest that participation in the CBITS intervention is associated with improvements in teacher-reported classroom behavior.

Research Question 3. After adjusting for baseline scores and covariates, will students in the intervention group (CBITS) exhibit significantly better classroom behavior as rated by an outside observer on the BOSS than those in the waitlist control (WC) group?

Statistical Hypothesis 3. Study condition will significantly predict post-treatment BOSS scores after controlling for all covariates, including baseline scores on the BOSS and the CPSS. This hypothesis will be analyzed using linear regression, regressing BOSS scores at post-treatment on study condition (CBITS or WC), controlling for baseline scores on the CPSS and the BOSS, as well as covariates identified a priori. Gender and ethnicity will again serve as control variables in the model. A significant result in the hypothesized direction (CBITS > WC) would suggest that participation in the CBITS intervention is associated with improvements in directly observed classroom behavior.

Research Question 4. After adjusting for baseline scores and covariates, will students in the intervention group (CBITS) report higher academic engagement as measured by the MES-Junior than those in the waitlist control (WC) group?

Statistical Hypothesis 4. Study condition will significantly predict post-treatment MES-Junior scores after controlling for all covariates, including baseline scores on the MES-Junior and the CPSS. This hypothesis will be analyzed using linear regression, regressing MES-Junior scores at post-treatment on study condition (CBITS or WC), controlling for baseline scores on the CPSS and the MES-Junior, as well as covariates identified a priori. Gender and ethnicity will again serve as control variables in the model. A significant result in the hypothesized direction (CBITS > WC) would suggest that participation in the CBITS intervention is associated with improvements in student perceptions of academic engagement.

Chapter 4: Conclusion

SUMMARY

The proposed study examines the impact of participation in the CBITS intervention on a range of classroom variables known to mediate academic achievement. CBITS is an empirically supported school-based treatment for at-risk students experiencing posttraumatic stress. While CBITS has demonstrated significant impact on clinical symptoms of PTSD, anxiety, and depression, its impact on academic indicators has yet to be fully evaluated. This study uses a randomized controlled design to evaluate CBITS on a sample of 160 sixth graders from a low-income, primarily-minority region in the Southwest U.S. Eligible participants include students who report significant exposure to trauma and elevated PTSD symptoms. Indicators of PTSD, student engagement, and classroom behavior will be collected at baseline and post-intervention. Post-score differences between the intervention and control groups will be analyzed for each outcome with adjustment for baseline differences.

It is expected that students in the intervention group when compared with the control group will exhibit lower levels of PTSD, more positive classroom behavior, and higher perceived engagement in learning. These predictions align with the research reviewed herein, which documents the relationship between academic and mental health functioning and reviews of outcomes included in SBMH research to date.

LIMITATIONS

A main limitation to this study is that neither the investigators nor the participants will be truly blind to the conditions; teachers may also become aware of conditions to which their students have been assigned. The risk in this case is that each may be vulnerable to intervention expectancy effects, such that the intervention students may be more likely to inflate their self-reports based on expectations of improvement, or else that teacher ratings might be influenced by knowledge of condition. In a similar vein, since multiple experimental and control groups will be in the same school, there is also a risk of intervention contamination, meaning that students in the control group may learn about intervention components from intervention group students.

Adding a follow-up data point would have been even more informative as to the trajectory of academic change. However, it would not have been ethical to make the control group wait an entire school year before participating in CBITS, especially given the gravity of PTSD. Future studies should include follow-up time points and examine whether changes in behavior and engagement are maintained over time, or perhaps even improve. If this design included achievement outcomes (such as GPA), then meditational pathways among the outcomes could be more directly explored.

Finally, while the BOSS measure of classroom behavior is a novel outcome for a school-based intervention study, it is significantly time-intensive to administer. It will also be difficult to coordinate so many observation times during the school day. Finding a rater who is able to commit so many hours over a concentrated period of time will likewise present a challenge. In spite of this limitation, inclusion of the BOSS allows for

some interesting comparisons in terms of a) how teacher vs. outside raters assess changes in classroom behavior, and b) how students perceive their own engagement vs. how they are objectively rated on it.

DISCUSSION AND IMPLICATIONS

Given the significant prevalence and negative impact of youth trauma, schools must do more to address the issue, especially as the consequences of untreated trauma unfold within school walls. The psychological and behavioral effects of trauma are significant, as are its long-term disruptions to developmental trajectories over the lifespan (Schwab-Stone et al., 1995). While all psychological problems interfere to some degree with daily functioning, the breadth and severity of trauma-related functional impairments may be significantly more disruptive to student academic and classroom functioning.

Schools not only provide access to all students, but they do so in familiar and supportive settings that may be especially conducive to trauma therapy (Rolfsnes & Idsoe, 2011). Well-developed and implemented school-based programs have the potential to address macro-level disparities in care and to improve the academic skills of individual students, *ultimately reducing* the high service costs these students might otherwise incur as the compounding long-term effects of their mental health condition.

School-based mental health programming will continue to have a relegated status on educational agendas until it can more definitively establish the academic impact of its programming (Adelman & Taylor, 2010). There is strong support for the claim that students will perform better in the classroom when they are mentally, socially, and

emotionally healthy (Zins, 2004). Studies such as this one can help to identify the mechanisms through which treatment affects learning and the features of the classroom context that support it. A staggering amount of resources are being spent on educational programs to increase achievement among low-performing students (Henrich et al., 2004). For some of these students, psychological barriers may prevent readiness to learn in the first place, and so for them, a mental health intervention may be more impactful on their school performance.

In spite of this lack in empirically supported academic outcomes, U.S. policymakers are recognizing the importance of socio-emotional variables. This is no more clearly evidenced than by the latest revision of the *No Child Left Behind Act* (called the *Every Student Succeeds Act*). Written into the policy is a requirement for states to describe how they will address bullying, measure school quality, and improve school climate. It allows schools to use Title I funds to implement SBMH programs, including multi-tiered systems of support, and offers grant money for school efforts to create healthy and safe learning environments. In this climate, SBMH programming can fill an educational need, while at the same time fulfilling its humanitarian one: improving access to mental health services for those most impacted and yet least likely to be treated.

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